Forest Practices Board

Logging Old Forest on TFL 47 – Sonora Island

Complaint Investigation #141147

FPB/IRC/196

July 2015

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Board Commentary

In the central and north coast regions of British Columbia, including Haida Gwaii, ecosystem-based management (EBM) has evolved over the past two decades and is focussed on maintaining ecological integrity and conserving biodiversity, while also addressing human well-being.

EBM in this area is driven by, and ultimately must satisfy, local and global public concerns about forest management. It is not just about managing to meet legal requirements but also requires embracing the spirit and intent of EBM. Those licensees that do not manage to the intent of EBM, may find they lose public trust and public confidence in the outcomes.

The investigation found that TimberWest's approach to identifying and maintaining old forest and rare and endangered plant communities on Sonora Island met legal requirements, but in the Board's opinion, did not meet the spirit and intent of EBM, and their approach needs improvement.

The Board recognizes that TimberWest had been reviewing its approach to management of old forests prior to the complaint, hired qualified biologists to assist in those efforts after the complainants raised their concerns, and continued to seek to understand EBM old forest expectations through various initiatives. The Board expects to receive further information on TimberWest's new approach, their implementation schedule and how it will contribute to improved retention of old forest and listed plant communities, particularly in landscape units that are in significant old forest deficit.

The Board acknowledges the efforts the Sonora residents took to provide sound information at considerable expense, to work with TimberWest and government, and to maintain constructive relationships. The Board recognizes that the complaint and subsequent investigation will improve forest management in the future and the Sonora residents deserve credit for that.

EBM implementation in the Great Bear Rainforest is occurring after many years of refining goals, objectives, background and intent documents, therefore it is critical that government provide comprehensive and clear guidance related to its legal land use orders. However, it is neither reasonable nor expected that guidance and legal orders can or will define every element and detailed expectation for EBM.

EBM implementation adds significant complexity to the work of forest professionals and forest licensees. Professionals must be diligent in seeking and consulting all sources of technical and scientific information about the specific value or issue they must address in their prescriptions. Where high-risk management thresholds are already exceeded and ecological integrity may be threatened, licensees are expected to demonstrate a higher level of due diligence through precautionary management of at-risk values. The public expects, in an era of professional reliance, that such consultations and diligence will occur, especially when it comes to complex management situations, such as those arising under EBM.

Finally, the Board would like to point out that earlier this year, we published an audit of TimberWest's operations in this same tree farm licence and found the company in compliance with legal requirements. That may appear contradictory to the results of this complaint investigation. However, a Board audit looks at compliance with the relevant laws and regulations, whereas a complaint investigation has more latitude to examine adherence to the spirit and intent of land use orders.

Executive Summary

In 2006, following an environmental campaign and a resource management planning process, the Provincial government, First Nations, industry and key environmental groups announced the coast land use decision for the Great Bear Rainforest, located on the central coast of BC.

Part of this agreement was to use ecosystem based management (EBM) on managed forest lands in the area. Government set out the legal objectives for implementation of ecosystem-based management by enacting the *South Central Coast Order* and the *Central and North Coast Order* in 2007.

EBM is a forest management approach intended to maintain ecosystem integrity while providing for societal needs. Ecological (old growth forest) representation and protection of at-risk plant communities are two key elements of ecosystem based management to help maintain ecological integrity and promote fully functional ecosystems on the BC Coast.

Residents of Sonora Island initially contacted the Forest Practices Board in 2013 with concerns about TimberWest's harvesting under EBM on Sonora Island. Following a field visit by the Board, TimberWest and the concerned residents agreed to work together to settle their differences. However, in February 2014, concerned residents contacted the Board again and filed a formal complaint asserting that TimberWest was harvesting old forest, harvesting in areas with at-risk plant communities, and not abiding by the spirit and intent of the *South Central Coast Order*.

TimberWest is one of several forest companies with operations in the *South Central Coast Order* area. TimberWest's TFL 47 is on northern Vancouver Island, the adjacent mainland, and the Discovery Islands. Much of the TFL is within the *South Central Coast Order*; however, the TFL includes only about 2.5 percent of the *South Central Coast Order* area.

Harvesting on the Sonora Island portion of the TFL occurred up to 1995, with no further harvesting until 2009 when TimberWest resumed harvesting. In 2013, it received a permit to harvest an additional six cutblocks, but voluntarily postponed harvesting on those blocks due to the concerns of residents.

In its complaint investigation, the Board interviewed TimberWest, government, and the complainants. It also field inspected seven harvested areas where the complainants had concerns about compliance with the *South Central Coast Order*.

The Board concludes that:

1. TimberWest's harvesting complied with the *South Central Coast Order* definition and its interpretation of the definition. However, the definition of old forest in the *South Central Coast Order* is difficult to apply for ecosystems on Sonora Island and an accompanying guidance document is not helpful.
2. The Board was unable to conclude if TimberWest's activities were inconsistent with requirements in the *South Central Coast Order* for at-risk plant communities due to ambiguities in government's definition of at-risk plant communities; the lack of further interpretive guidance, and the general challenges with identifying plant communities after they have been disturbed.

3. In the Board's opinion, TimberWest did not manage the forests consistent with the spirit and intent of EBM. After residents of Sonora Island made their concerns known, TimberWest took steps to develop an approach that is more consistent with the spirit and intent of EBM. All the details of this new approach are not yet clear.

The Board recommends that TimberWest provide it with information on their future EBM approach, and that government clarify the definitions and guidance for old forest and at-risk plant communities.

Introduction

The Complaint

In March 2014, two residents of Sonora Island complained to the Forest Practices Board that TimberWest Forest Corporation (TimberWest) was logging old forest and red- or blue-listed[1] plant communities on the southern portion of Tree Farm Licence 47 (TFL 47). The residents were concerned that the harvesting did not comply with legal requirements or the spirit and intent of ecosystem-based management (EBM) in the South Central Coast region of the Great Bear Rainforest (GBR).[2] The complainants assert that there is very little old forest left in the area, and the remaining amounts are, below the *South Central Coast Order* (SCCO) targets in most landscape units within the southern portion of the GBR.

The GBR is the name coined by environmental groups in the mid-1990s to refer to a region of temperate rain forest on the British Columbia coast between central Vancouver Island and Southeast Alaska. This name, although unofficial, is widely used and easily recognizable by the public. Also, the forest companies and environmental groups that have participated in EBM planning and implementation working groups commonly use this term.

The complaint centres on Sonora Island, in the Thurlow landscape unit and, to a lesser extent, the Fulmore and Gray landscape units, at the very south end of the GBR (Figures 1 and 2).

Background

South Central Coast Order

In 2006, the Provincial government, First Nations, industry and key environmental groups announced the coastland use decision for the GBR. This decision grew out of an environmental campaign in the GBR, and the central and north coast land and resource management planning processes. The land use decision included commitments for land use zoning, collaborative governance and EBM; a new forest management approach intended to maintain ecosystem integrity while providing for human well-being.

Government followed this decision by enacting SCCO and the *Central and North Coast Order*, under the authority of the *Land Act*. The two orders together set out the legal objectives for implementation of ecosystem-based management in the GBR (Figure 1). The SCCO came into force in 2007 and applies to the southern part of the GBR. Amendments to the order occurred in 2009 and 2013. Government is currently working on a further amendment.

TimberWest is one of several forest companies with operations in the SCCO area. TimberWest's TFL 47 is on northern Vancouver Island, the adjacent mainland, and the Discovery Islands. Much of the TFL is within the SCCO; however, the TFL covers only about 2.5 percent of the SCCO area.

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[1] Red-listed plant communities are those listed as extirpated, endangered, or threatened in British Columbia. Blue-listed plant communities are those considered to be of special concern (formerly vulnerable) in British Columbia. The BC Conservation Data Centre maintains the lists <http://www.env.gov.bc.ca/atrisk/red-blue.htm>. Schedules 5 and 6 of the SCCO list the red and blue-listed plant communities that are subject to the Order.

[2] The South Central Coast Order defines old forest as *a stand of trees at least 250 years of age*.

The SCCO has 15 objectives. The most relevant to this complaint are:

- objectives for landscape level biodiversity; and
- objectives for red- and blue-listed plant communities.

Ecosystem Based Management in the Great Bear Rainforest

Even before the coastland use decision in 2006, a coalition of forest licensees and environmental groups, the Joint Solutions Project, collaborated on planning and management principles for EBM.[3] This group designed EBM to address global concerns for conservation on BC's central and north coastal region, in conjunction with other work such as the GBR protected areas network. TimberWest participated as an associate member early in that process.

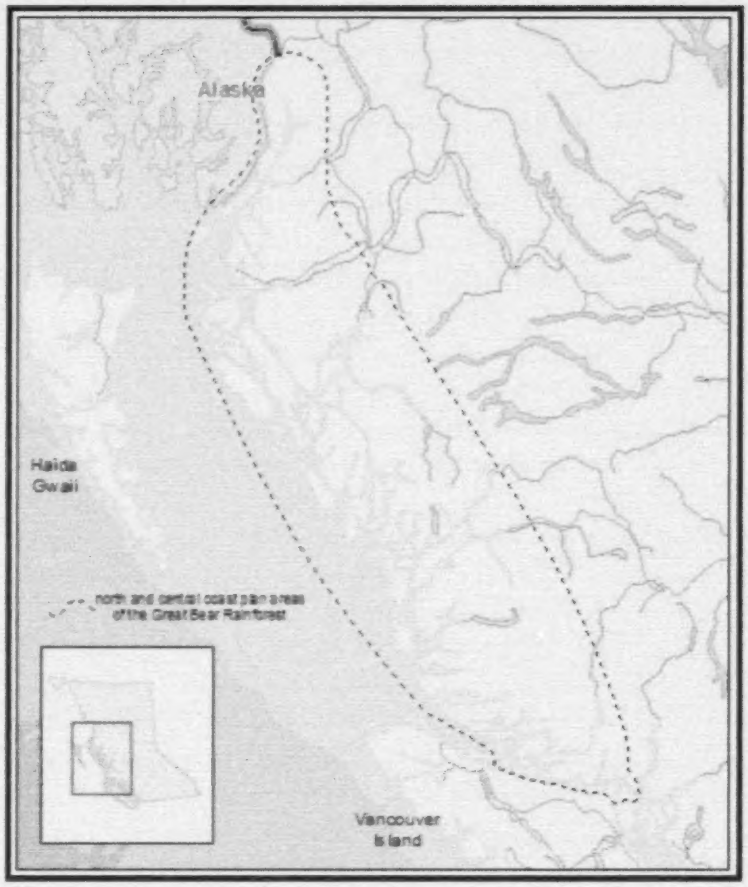

Figure 1. Location and approximate boundary of the Great Bear Rainforest. Sonora Island is at the southern tip.

Working with the Joint Solutions Project, the Coast Information Team developed the *EBM Planning Handbook* specifically for the GBR in 2004.[4] The Handbook provided guidance on implementing EBM across multiple scales—from regions, through landscapes and watersheds to individual sites. It identified principles, goals, objectives, and key elements of EBM as developed by the Coast Information Team.

[3] The members of the Joint Solutions Project, along with Provincial and First Nations governments, continue to work on implementation of EBM and recommendations for achievement of EBM. TimberWest continues to share data and support the process with analysis and advice.

[4] The Coast Information Team was established by the provincial government, First Nations, environmental groups, the forest industry and communities to provide independent information using the best scientific, technical, traditional and local knowledge. This team produced the Handbook to provide guidance on implementing EBM. The information provided in the Handbook has been used to aid in creation of the objectives in the SCCO and is a key reference for those seeking guidance and information regarding intent to help meet these objectives.

EBM is a forest management approach intended to maintain ecosystem integrity while providing for societal needs, referred to as human well-being. The Coast Information Team defined EBM as *an adaptive approach to managing human activities that seeks to ensure the coexistence of healthy, fully functioning ecosystems and human communities*. Ecological representation and protection of at-risk plant communities are two key elements of EBM to help maintain ecological integrity and promote fully functional ecosystems on the BC Coast.

EBM Goals

The overarching EBM goals, as stated in the Handbook are:

1) Maintaining ecological integrity by sustaining the biological richness and services provided by natural terrestrial and marine processes, including the structure, function, and composition of natural ecosystems at all scales through time.
2) Achieving high levels of human well-being where human well-being is a condition in which all members of society can determine and meet their needs and have a large range of choices and opportunities to fulfill their potential.

Ecological representation

An important part of EBM in the GBR is ecological representation to help maintain biodiversity across the managed landscape: providing habitat for a range of unknown or lesser-known species; maintaining ecological benchmark sites for long term monitoring; and providing habitat refugia for a range of species within the managed landscape.[1] Representation objectives attempt to accomplish this by providing a system of reserves to maintain the range of regional ecosystem types in their natural state, which, on the BC central coast, is often characterized by old-growth habitat attributes.

Old growth forests are important because they have structural elements and unique ecological conditions, developed over time, that provide habitat for many species dependant on conditions not found in younger forests. Landscapes in the GBR naturally had a high proportion of old growth forest because they developed with relatively low levels of natural disturbance. Forest harvesting and other disturbances over the past century replaced a significant amount of old growth forest in this region with young forest. EBM strives to conserve enough well-distributed forest with old characteristics to maintain broad ecological functioning. Where there is not enough old growth forest, a key focus for EBM becomes recruitment of younger forest to develop into old growth forest over time.

The EBM Handbook describes the methodology used to determine the required amount of old growth forest to maintain ecological integrity. It incorporates an assumption that risk to ecological integrity increases as the proportion of old growth forest deviates further from historic levels. Natural forests subjected to normal ecosystem disturbances over time have a typical distribution of older stands, within a range. Young stands replace older stands as natural disturbances occur or as humans harvest forests. Associated work done by the Coast Information Team estimated the historical natural proportions of old growth forest and associated risk thresholds as actual proportions deviate from the natural ranges (Appendix 1).

Distributing representative habitat patches of old growth forest across the managed landscape is important to provide functional connectivity for species that use such patches. Planning a mapped

network of patches to allow for such a distribution across the landscape is therefore favoured over non-spatial[5] accounting.

Protection of at-risk plant communities

For EBM to maintain ecological integrity it is also important to conserve ecological and biological diversity across the full range of plant communities. These unique assemblages of plant species each create specific habitat conditions for other species. Therefore, at-risk plant communities require more attention and protection in a conservation strategy for EBM. In BC, the Conservation Data Centre designates at-risk plant communities as red- or blue-listed[6] based on several criteria including threats, short and long-term trends, range extent and area of occupancy, with red-listed plant communities being the most at-risk.

Conservation Data Centre

The BC Conservation Data Centre, operated by the BC Ministry of Environment, maintains information on plants, animals and ecosystems at risk, including red- and blue-listed ecological communities. It is the centralized repository for scientific information of species and ecosystems at risk in BC and includes information on conservation status and known locations.

BC Conservation Data Centre website: http://www.env.gov.bc.ca/cdc/

Implementation of EBM

While the EBM Handbook outlines the intent and scientific grounding for EBM in the GBR, the SCCO built on that foundation by providing a legal framework for the implementation of EBM. As well, government wrote a guidance document, *Background and Intent Document for the South Central Coast and Central and North Coast Land Use Objectives Orders*, (Background and Intent Document) in 2008 to "facilitate a clear understanding of the Orders," providing insights that tie the intent of EBM to the legal requirements and implementation.[ii]

Ecological (old forest) representation

To facilitate an effective strategy to conserve forests with old characteristics, government put into regulation (via the SCCO) the proportions of old forest required for each ecosystem and the maximum number of years to achieve these proportions if they are already below the requirements. Using a risk-managed process, old forest targets for the Thurlow, Gray and Fulmore landscape units were set between 24 and 30 percent (Appendix 1).

The required amount of old forest can be met through several conservation strategies. First, pre-existing protected areas, such as parks and ecological reserves provide some old forest stands. Second, landscape, watershed and site-level reserves identified through ongoing planning processes provide additional old forest stands or recruitment areas. Third, stand-level retention identified during cutblock planning provides another component. Together, these strategies must provide enough old forest to meet the requirements.

Old forest recruitment

According to the SCCO, licensees operating within an ecosystem unit that has a deficit of old forest must meet the target within 250 years. Licensees may devise a recruitment strategy to ensure that the

[5] Not physically delineated or mapped.

[6] The BC Conservation Data Centre uses the term *ecological communities* rather than *plant communities*, to refer to plant communities and plant associations that include a wide range of ecosystems in BC.

requirements are met. The Background and Intent Document provides little guidance on dealing with recruitment, except stating that, "recruitment of oldest possible age classes first will allow for old forest representation targets to be achieved in the shortest time possible." The Handbook acknowledges that some trade-offs between maintaining ecological integrity and achieving high levels of human well-being are necessary.

Protection of at-risk plant communities

Another key strategy to achieve the goal of maintaining ecological integrity is to protect and maintain at-risk ecosystems. Therefore, the SCCO includes requirements for red- and blue-listed plant communities. However, the Order provides no description of these listed plant communities beyond their names. The Background and Intent Document does provide some additional information, but it is not very clear and though the Conservation Data Centre is the primary source of information on red- and blue-listed plant communities, the Background and Intent Document does not refer to it.

Strategic landscape reserve designs

A key, but non-legal, component of EBM implementation is the use of strategic landscape reserve designs (SLRDs) as a tool for meeting objectives for biodiversity while considering spatial distribution across the landscape. SLRDs are spatially defined networks designed to reserve representative areas of suitable old forest; identify recruitment stands when deficits in old forest exist; and meet some of the other objectives, such as those pertaining to red- and blue-listed plant communities and monumental cedar.[7] Licensees who were members of the Joint Solutions Project designed a network of SLRDs in 2011.

TimberWest's Operations in the South Central Coast under the SCCO

Harvesting on the Sonora Island portion of the TFL occurred up to 1995, with no further harvesting until 2009 (Table 1). Since 2009, TimberWest has harvested approximately 480 hectares in 40 cutblocks in this area. The Ministry of Forests, Lands and Natural Resource Operations (FLNR) issued a cutting permit in 2012 to harvest 130 hectares in 6 additional cutblocks. In 2013, TimberWest voluntarily postponed harvesting on those 6 blocks due to the concerns of residents, including the complainants. These blocks are on the southeastern corner of Sonora Island in an area where there has been little harvesting for several decades.

When the provincial government determined the allowable annual cut (AAC) for TFL 47 in 2014, it set a timber harvest cap of 365 000 cubic metres per year within the SCCO portions of the TFL.[iii] This includes the Thurlow, Fulmore and Gray landscape units. Sonora Island is within the Thurlow landscape unit.

[7] *Monumental Cedar* means a large old western or a large old yellow cedar that will fulfill the domestic needs of the applicable First Nations for cultural cedar uses.

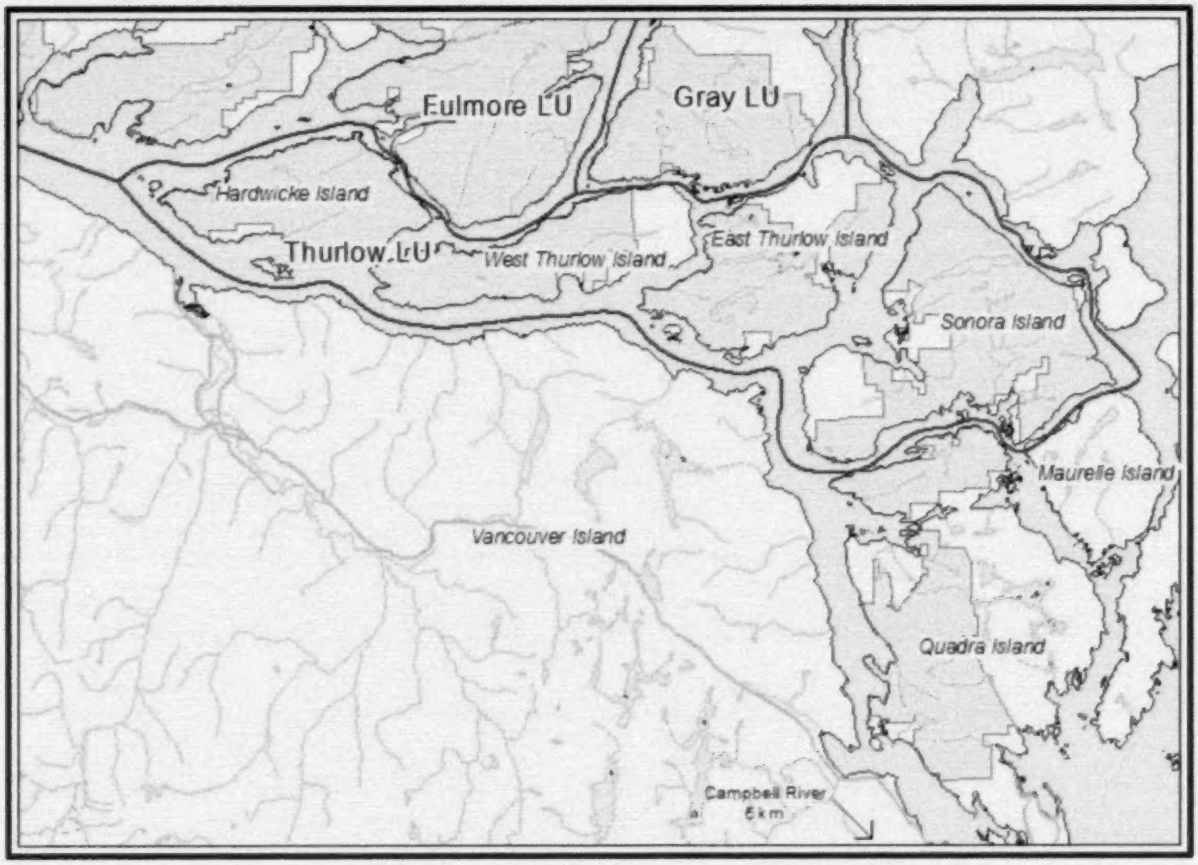

Figure 2. Landscape units are outlined in red, and TFL 47 is shaded pink.

Complaint History

In early 2013, residents of Sonora Island contacted the Forest Practices Board, concerned that TimberWest might be operating in violation of the SCCO. In April 2013, Board staff attended a field inspection on Sonora Island, along with TimberWest representatives, island residents, FLNR staff and others. Following this visit, TimberWest and the concerned residents agreed to work together to settle their differences. At that point, the Board stopped its active involvement to allow these talks to progress.

Residents of Sonora Island, including the complainants, continued to examine TimberWest's past activities and ongoing plans. In 2013 and 2014, the complainants visited several recently harvested cutblocks on Sonora Island where they thought TimberWest had harvested old forest. On seven small areas within six harvested cutblocks, the complainants examined tree stumps to estimate the age. They counted and painted the stumps they had determined to be 250 years of age or older. They summarized their data, with photographs, in reports for each of the seven areas. The areas of old stumps ranged from about 0.3 to 1.4 hectares. They then made their complaint to the Board.

Table 1. Timeline

Date	Occurrence
Pre 1995	Forest harvesting began in this area in the 1880s. Later, two of the first TFLs (#2 and #12) covered the area. These became TFL 47, held by TimberWest today.
1997	Environmental groups coined the name "Great Bear Rainforest" and commenced the campaign to change logging practices in the area.
2004	The BC government agreed that about 14 000 square kilometres, about 33 per cent of the GBR, would be put under some form of protection, and that ecosystem-based management would be required throughout the designated area.
Dec 2006	TimberWest FSP approved. This FSP had special wording about deferring old growth harvest in the Hyacinth Lake, Owen Bay, and Hole in the Wall areas of Sonora Island, due to concerns brought forward by Sonora Island residents.
August 2007	The South Central Coast Order was established.
March 2009	A major amendment revised the South Central Coast Order. This amendment included a change in the definition of old-forest age from 180 to 250 years.
Early 2009	Harvesting commenced on Sonora Island after several years with no logging activity.
2010	TimberWest sent out letters to stakeholders, including Sonora residents, advising of proposed development and included a map showing projections for cutblocks, including the six blocks now under cutting permit.
2011 - 2013	Road construction on a new development began in 2011, and TimberWest later obtained a cutting permit (CP 11G) that included six new blocks on southeastern Sonora Island. Road construction into the new blocks commenced. Sonora Island residents had previously raised concerns that one of these blocks may include old forest.
Early 2013 to present	TimberWest and Sonora residents commenced dialogue on old forest definition, red-/blue-listed plant communities. TimberWest postpones harvesting in the Sonora cutblocks.
April 2013	Sonora residents contacted FPB regarding perceived harvesting of old forest and red- or blue-listed plant communities.
April 2013	Joint field trip to Sonora Island conducted. Residents, government, FPB and TimberWest personnel attend.
June 2013	Report entitled *Assessment of Old Forest and Associated Biodiversity Values – Block 11-370 and Adjacent Areas, TFL 47, Sonora Island, BC* commissioned by Ross Campbell of Sonora Island, was completed.
January 2014	Report entitled *JSP Recommendations on Final Implementation of Ecosystem-Based Management in the Great Bear Rainforest* completed and presented to government (further revisions occurred in 2014).
March 2014	Complaint to FPB launched. FPB investigation commenced.
Mid 2014 to present	TimberWest and other licences cooperatively worked on a new SLRD for the southern landscape units and harvest planning on Sonora—fully funded by TimberWest, the lead licensee.
July 2014	Field trips conducted to Fulmore, Gray and Thurlow landscape units with Board staff, TimberWest staff and the complainants.

Figure 3. Stumps from old trees (older than 250 years) were marked with orange paint by the complainants in block 11-21A. *(NOTE: For scale, the stumps painted orange are 70+ cm in diameter)*

Investigation Results

The Board investigation focused on the following questions relating to TimberWest's operations in the Thurlow, Gray and Fulmore landscape units:

1. Did TimberWest harvest old forest consistent with the SCCO?
2. Did TimberWest conserve red- or blue-listed plant communities consistent with the SCCO?
3. Did TimberWest follow the spirit and intent of EBM?

To investigate these questions, the Board conducted interviews, reviewed available literature, examined forest inventory data and visited the area. For context, the Board also reviewed the role of government in these questions.

1. Did TimberWest harvest old forest consistent with the SCCO?

The SCCO defines old forest as a stand of trees at least 250 years old. The SCCO lists the minimum amounts of old forest required for reservation in each ecological unit within each landscape unit.[8] Further harvesting of old forest should not occur in ecological units where the amount of old forest is below the minimum requirement.

[8]The ecological units in use here are termed *site series surrogates*. They are an alternate method of classifying and mapping ecosystems that can be defined with currently available forest information. Each site series surrogate is a combination of the primary tree species present and the site productivity rating. Site series surrogates are used instead of biogeoclimatic site series because the data for site series was not universally available across the SCCO area.

TimberWest told the Board that, where there is a deficit of old forest in an ecological unit, it takes the following approach:

- planners field verify ages indicated on maps and exclude areas in the ecological unit mapped as old forest from harvesting plans; and
- field crews exclude unmapped areas of old forest if found during layout of cutblocks.

TimberWest and other forest companies provide data annually to FLNR on the amount of old forest in each landscape unit and ecological unit within the SCCO area. FLNR maintains this database as a central repository for information related to old forest abundance in the SCCO. The database indicates that TimberWest is not harvesting old forest where the SCCO prohibits such harvest.

However, in 2013 and 2014, the complainants examined several harvested and proposed cutblocks on Sonora Island and found examples of what appeared to be old forest within harvested or planned harvest areas. The FLNR database shows that many of the ecological units in this area have less old forest than the targets specified in the SCCO. The drier biogeoclimatic subzones—the CWHxm and CWHdm—have consistent deficits across these subunits.

A Sonora Island resident hired consultants—a professional forester and professional biologist—to assess one of the proposed cutblocks (block 11-370) for the presence of old forest. The two consulting professionals concluded that a 5.6-hectare area of proposed block 11-370 "consists of *old forest* as defined in the South Central Coast Order."[iv] TimberWest told the Board that it did not dispute this professional opinion nor does it agree or disagree with it. Block 11-370 is one of the proposed blocks in which harvest has been postponed.

The Board inspected the six harvested cutblocks (Table 2) where the complainants alleged harvesting of old forest took place.[9] All blocks inspected had small areas (0.3 to 1.4 hectares) containing stumps of old trees cut during the recent harvest. TimberWest's site plans and ecosystem mapping indicated that some of the old stumps were located on areas within the cutblocks that may have been ecological units with old forest deficits. Three of the six cutblocks were not subject to the SCCO because they had been planned and designed (but not harvested) prior to the notice regarding the SCCO and had been 'declared' in the forest stewardship plan.[10]

[9] These cutblocks were viewed from a helicopter or on foot on July 16, 2014.

[10] "Declaring" under the Forest Planning and Practices Regulation (FPPR) section 14(4) that a cutblock has had all necessary assessments done provides planning protection for that block so that future orders do not apply. Cutblocks can also be protected under the *Forest and Range Practices Act* section 196 when the blocks were part of a previous Forest Development Plan. These are ways of protecting the often-significant investments necessary to plan and prepare a cutblock for harvest. Forest Stewardship Plans are legally required documents prepared by forest licensees that indicate how licensees will meet certain government objectives, including those in orders such as the SCCO.

Table 2. Cutblocks Reviewed

Block	Declared (Yes or No)	Old Trees Harvested*	Compliance with Old Forest Retention	Compliance with Red- and Blue-Listed Requirements	Comments
11-297	No	77	In compliance – the "Fd Poor" ecological unit has a surplus of old forest	In compliance	Blue-listed plant community may have been present. However, in compliance because 70 percent or more of the occurrence has been preserved.
11-293 Site A	No	134	In compliance – as above	In compliance	As above.
11-293 Site B	No	27	In compliance – as above	In compliance	As above.
11-21A	No	53	Area of old forest would not meet the TimberWest interpretation of the definition of old forest	Not determined	A site series associated with a red-listed plant community was present according to TW's site plan. Old trees were present as evidenced by the stumps. The Board was unable to ascertain the presence of the red-listed plant community.
11-73B	Yes	33	**	**	SCCO requirements do not apply to declared blocks.
11-68D	Yes	92	**	**	SCCO requirements do not apply to declared blocks.
11-74C	Yes	16	**	**	SCCO requirements do not apply to declared blocks.

** The complainants documented the old trees (greater than 250 years of age) harvested. Board viewed all blocks from the air, and visited block 11-293A on the ground.*

*** The Board did not assess compliance on these blocks. TimberWest declared them prior to the requirements of the SCCO taking effect.*

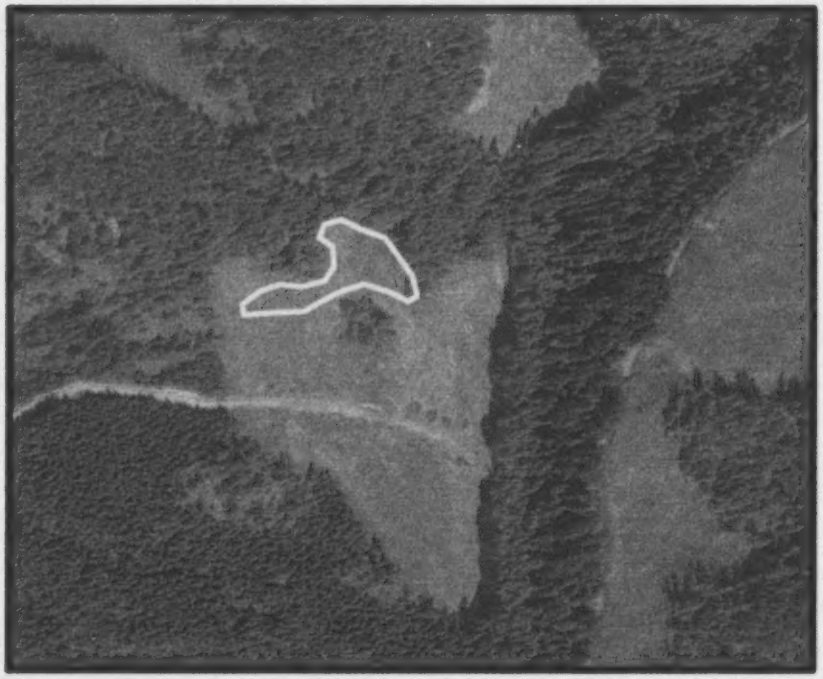

Figure 4. Block 11-293 on Sonora Island showing the location of stumps of old trees.

Records of the amount of harvesting, and the amount of old forest remaining in the Thurlow, Grey and Fulmore landscape units indicate that TimberWest is complying with old forest requirements in the SCCO by not harvesting old forest. Yet, as noted above, the Board saw evidence that old trees (greater than 250 years of age) were harvested. The consultants' review of block 11-370 also noted that old forest was present prior to harvesting. Why the differences?

One reason for the difference is that the records referred to above use the forest inventory to determine location and amounts of old forest. The forest inventory does not necessarily classify small stands of old trees as old forest. These stands may be lumped in with areas of young forest. In addition, groupings of older trees within a matrix of younger forest are often classified as young forest, since the stand age is an average of the age of all trees present. Therefore, small patches of old trees may exist without showing up in the records.

Figure 5. Large old Douglas-fir trees within a matrix of younger trees in proposed cutblock 11-370.

The other reason relates more directly to the definition of old forest, where the disparity between harvest reports and observations by both the Board and the consulting professionals is a result of differing interpretations of the SCCO definition of old forest.

The EBM documents and literature produced by the Coast Information Team and government refer to old growth and old growth forests. However, the SCCO uses the term 'old forest' and provides only age criteria to define it. TimberWest's current view is that there is no requirement or intent to consider the old growth characteristics of a stand, even though this is a key concept in EBM literature. The Joint Solutions Project continues to use the term old growth when referring to requirements in the Order.[v]

What is old growth forest?

Defining old forest, where it exists, is important for conservation of biodiversity because of the unique habitat attributes found in such forests. As such, definitions for old forest vary depending on the ecosystems they exist in or other circumstances. An old forest in coastal BC will be different from one found in the interior. Old forests are heterogeneous, structurally diverse, and typically consist of trees of many sizes and ages, sometimes including those over 250 years, as some old trees die and younger trees establish in the gaps created in the stand. They are characterised by a high density of old forest habitat attributes, such as legacy trees (that have survived stand-replacing disturbance), large snags, large hollow logs and coarse woody debris, multi-layered canopies, moss platforms, heavy lichen loads, etc.

Ecological representation, which is the point of the old forest targets, intends to maintain the range of regional ecosystem types in their natural state mostly for the conservation of biodiversity. On the BC central coast, old growth habitat attributes generally characterize the natural state of representative ecosystems. In the Board's view, age seems to be a proxy in the SCCO to define old forest ecosystems to facilitate high level operational planning. This is due to limitations of forest inventory data for identifying the old growth characteristics found in the variety of coastal forest types (EBM Handbook, page 75).

Nonetheless, the SCCO definition of old forest leaves several factors open for interpretation including:

1. factors that comprise a stand, including minimum stand size;
2. the proportion of the stand that must be 250 years of age or older;
3. measures to define old forest proportion (i.e., proportion of volume, number of stems, or basal area)

In addition, the SCCO definition is not helpful in landscapes where a strict application of age criteria is challenging. In the very southern portion of the SCCO area, some of the forests were disturbed in the past by wildfires, windthrow and some old selective logging. These disturbances created a mosaic of stand types including some young mature stands with a discontinuous overstory of large old trees. Such stands do not fit the simple SCCO definition using age alone, even though they possess many old forest habitat attributes. Accordingly, TimberWest helped to organize and participated in two workshops where the intent of the old forest definition was discussed: the intent of retaining old forest; minimum polygon size; and how to deal with second growth with old trees dispersed within it.

As a result, TimberWest developed a more detailed interpretation for its own internal use—a stand of trees at least 1 hectare in size with at least 50 percent volume of trees being old (at least 250 years old).

FLNR was aware of TimberWest's interpretation of old forest. Other forest operators in the area also developed their own interpretations. For example, another major forest licensee operating in the area says that old forest must be comprised of 50 percent by volume old trees, and accepts old forest

stands down to one half hectare or less—anything that can be classified as a separate stand by timber cruisers. Another licensee told Board that it relies on the forest inventory classification alone to define areas of old forest.

In response to concerns raised by the Sonora residents and in the report by their consultants,[vi] TimberWest began developing a new and comprehensive interpretation of the SCCO definition in 2013. The interpretation is currently being field-tested.

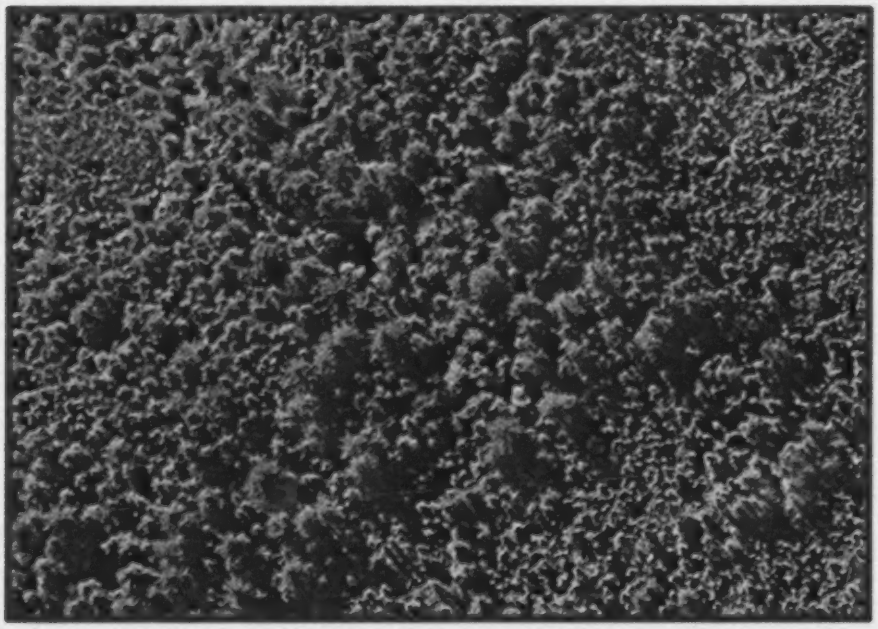

Figure 6. This aerial image shows older trees in a matrix of younger trees on southeast Sonora Island. Should this be classified as an old forest, or a young forest with some veteran trees?

Finding

FLNR records of the amount of harvesting and the amount of old forest remaining in the Thurlow, Grey and Fulmore landscape units indicate that TimberWest is complying with old forest requirements in the SCCO by not harvesting old forest, as defined in the Order.

However, the legal definition of old forest found in the SCCO leaves some questions open for interpretation and is not helpful in landscapes where a strict application of age criteria is challenging. As well, government provides little guidance for interpretation by licensees.

2. Did TimberWest conserve red- or blue-listed plant communities consistent with the SCCO?

The Board inspected seven harvested sites identified by the complainants where red- or blue-listed plant communities may have existed. Three of the sites may have supported blue-listed plant communities, but the requirement to maintain 70 percent of these occurrences would have been met in similar areas of directly adjacent un-harvested forest. Another three of the sites were not subject to the SCCO because TimberWest "declared" them. The remaining site, according to the licensee's site plan, was classified with a BEC subzone and site series that is on the SCCO red-listed plant community schedule. TimberWest did not identify this site as old forest and, therefore, did not manage it as a red-listed plant community. The Board noted that there were many stumps of old trees

(greater than 250 years) on this 0.3-hectare site but could not determine if it hosted a red-listed plant community prior to harvest.

There are rules for red-listed and blue-listed plant communities to guide harvest planning in the SCCO, but the details on how to identify the communities are not clear. The CDC provides some guidance, but it too is insufficient for definitive field identification. The SCCO says each occurrence of a red-listed plant community must be protected in its entirety during a primary forest activity, and 70 percent of each occurrence of a blue-listed plant community must be protected.[11]

Schedules 5 and 6 of the SCCO identify the plant communities as units in the biogeoclimatic ecosystem classification (BEC), with no other descriptive characteristics provided.[12] This has led to confusion about the plant species composition and stand age of listed communities. Both TimberWest and FLNR told the Board that the SCCO objectives for red- and blue-listed ecosystems are generally interpreted to apply only to stands that are 250 years of age or older, except on fluvial sites. Yet, both the Conservation Data Centre and FLNR staff told the Board that old forest is not a prerequisite for non-fluvial red- or blue-listed plant communities to exist.

The Conservation Data Centre and the FLNR staff advised the Board that well-developed plant communities could appear at younger ages and in stands not classified as old forest under the SCCO definition.[13] It is the presence of the plant community and site conditions, not the stand age that matters. The BEC ecosystem classification field guides enable the user to identify sites for potential red- or blue-listed plant communities. Yet, it is overly simplistic to determine the presence of these communities using a simple 250-year age threshold. The Conservation Data Centre website's frequently asked questions section says "mid-seral stages of a forest community can definitely be considered as an element occurrence of an Ecological Community."

The Background and Intent Document states "preservation of red- and blue-listed plant communities *most often* refers to those sites that are old seral ..." and that "for non-fluvial[14] ecosystems, if greater than 50 percent of the volume on the site has *old forest attributes* the plant community should be identified and reserved accordingly." Some could interpret the use of the words "old forest attributes" to mean that an "old forest" designation as defined by the SCCO is not necessary. This interpretation would be consistent with the approach suggested by the Conservation Data Centre. However, neither the SCCO nor the Background and Intent Document refer to the Conservation Data Centre, even though it is the primary source of information on red- and blue-listed plant communities in BC.

Listed plant communities are difficult to determine using forest inventory information. Their occurrences can be approximated using ecosystem mapping and stand age information but they

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[11] There are some minor allowances for road access or safety concerns.

[12] Biogeoclimatic ecosystem classification is a system that groups similar segments of landscape (ecosystems) into categories of a hierarchical classification system. Elements of climate, vegetation, and site are used to arrive at a classification. The system is widely used in forest management within BC.

[13] The British Columbia Conservation Data Centre is a government agency that systematically collects and disseminates information on plants, animals and ecosystems (ecological communities) at risk in British Columbia.

[14] Ecosystems supporting non-fluvial plant communities are those that are not typically subjected to fluvial disturbances. Because of lack of fluvial disturbances, they are more likely to support old forests than fluvial influenced ecosystems. In addition, plant communities designated as red- or blue-listed may appear at older stand ages than in fluvial ecosystems. However, old forest is not a prerequisite for these designations.

occurrence must be confirmed through field examinations. TimberWest has red/blue approximation maps to help it avoid the listed plant communities at the planning stage and avoid harvesting old forest where the listed plant communities are thought to exist. TimberWest—and other forest licensees operating in the SCCO area—generally have assumed that listed plant communities do not exist, except in stands defined as old forest.

The Board notes there is little guidance material available to aid in identification of red- or blue-listed plant communities. One document that is available, *A Field Guide to Red-Listed Ecosystems of the Central Coast Planning Area*,[vii] does not cover the southern portions of the GBR where the highest concentrations of red-listed ecosystems occur.[viii] Also, there is no requirement to track the 70 percent retention target for each occurrence of a blue-listed plant community. This could result in harvesting too much of a blue-listed plant community if no record exists of the previous 30 percent removal. However, this is not the case within TimberWest's tenures as it spatially maps and tracks the 70 percent targets for blue-listed plant communities.

Findings

One of the seven harvested sites viewed by the Board was subject to the SCCO, had concentrations of old trees (greater than 250 years of age) and included a small area that could contain a red-listed plant community. TimberWest did not think that the old trees present there constituted an old forest as defined in the SCCO and, therefore, did not consider that a red-listed plant community could be present.

The Board is unable to conclude if TimberWest's activities were inconsistent with requirements in the SCCO for red- and blue-listed plant communities, in spite of finding evidence that there were old forest attributes before harvesting on the site in question. This inconclusive finding is due to: the ambiguities in government's definition of red- and blue-listed plant communities; the lack of further interpretive guidance, particularly on the role of old forest in defining these plant communities; and the general challenges with identifying plant communities after they have been disturbed.

3. Did TimberWest follow the spirit and intent of EBM?

EBM set high expectations for forest planning and practices in the GBR. Government(s), industry groups and environmental organizations continue to tell the world about its virtues.[ix] In 2006, the World Wildlife Fund awarded the participants in the GBR the Gift to the Earth Award, its highest honour.[x]

The SCCO establishes legal objectives for the implementation of EBM in the southern portion of the GBR. These objectives emerged out of two years of negotiations to build agreements between Coastal First Nations groups and the provincial government. The SCCO objectives are often specific, measurable and highly technical, similar to practice requirements. Proper implementation to achieve these objectives requires an understanding of the spirit and intent of EBM in challenging operational situations that do not fit with the SCCO definitions. Understanding spirit and intent not only ensures implementation stays consistent with the original concept of EBM, but it helps to maintain public confidence in the outcomes, which is important for a process driven by social licence. To support this notion, the Association of BC Forest Professionals advises that, "the forest professional is responsible to seek understanding of non-statutory expectations as they relate to principles of good forest stewardship." Further, the same document states "plans can state they are consistent with a litany of

statutory requirements...plans need to include consideration of more than just statutory obligations."[xi]

Professionals can find some useful elements of EBM spirit and intent embedded in the preamble to the SCCO, including some perspective on EBM goals and how the SCCO fits with EBM. However, for a complete understanding of spirit and intent, review of other foundational documents is required. In fact, government(s) saw fit to design the Background and Intent Document for the SCCO. Even so, the Background and Intent Document by itself is not comprehensive—it does not provide a complete understanding of the durable foundations of EBM, as in the EBM Handbook, including the overarching goals, principles and the intent for various conservation measures. Accordingly, the Background and Intent Document lists key documents for further reference, such as the EBM Handbook.

To determine if the spirit and intent of EBM was met, the Board reviewed key background documents in the development of EBM and the SCCO. The Board then considered the performance of TimberWest and government in meeting the spirit and intent. Because spirit and intent of EBM is not clearly described in one document and is subjective in nature, its assessment required judgement by the Board. The findings for this question are, therefore, based on the Board's opinion of the spirit and intent of EBM.

Maintenance of Old Forest Stands

Old forest is in short supply in the southern landscape units in the GBR (Appendix 1, Table 3). The Thurlow Landscape Unit (LU), in particular, is in deficit. Only 12.2 per cent of the forested area is old, while the target amount is 29.7 percent (Figure 7 and Appendix 1, Table 4).

The Board noted several instances within the Thurlow Landscape Unit where stands with mixtures of old trees (over 250 years) and younger trees were recently harvested (Table 2). Given the rarity of old trees and old forest in this portion of the GBR, maintaining a substantial portion of these stands would have demonstrated that "cautious management targets and thresholds" were guiding "reserve design, resource development and where necessary restoration planning" as stated in the EBM Handbook.[xii] With only 12 percent old forest in the Thurlow Landscape Unit, the ecological risk is substantially higher than the high-risk threshold of 29.7 percent.

Surrendering declared cutblocks with outstanding conservation values, and low levels of investment by the licensee,[15] could demonstrate a commitment to the spirit and intent of EBM. TimberWest has not surrendered any declared blocks. However, it told the Board that it had deferred harvesting of several of these blocks and indicated that it may surrender some of them in the future.

In addition, because of the rarity of old forest in this area, it is the Board's opinion that a cautious approach to defining old forest stands would better meet the spirit and intent of EBM. The lack of clarity in the SCCO definition is a problem, prompting TimberWest to design its own interpretation and explore the intent with other licensees in several workshops. Based on these workshops and

[15] Licensees must invest resources completing cutblock engineering, assessments, and sometimes infrastructure prior to issuance of a cutting permit. Sometimes rules for harvesting change in certain areas after these investments. The SCCO is an example of such a change. For this reason, government has provided a mechanism whereby licensees can 'declare' cutblocks when such investments are made. Harvesting these cutblocks is the only way for licensees to recover these investments.

concern from the Sonora Island residents, TimberWest is now conducting further work on its definition.

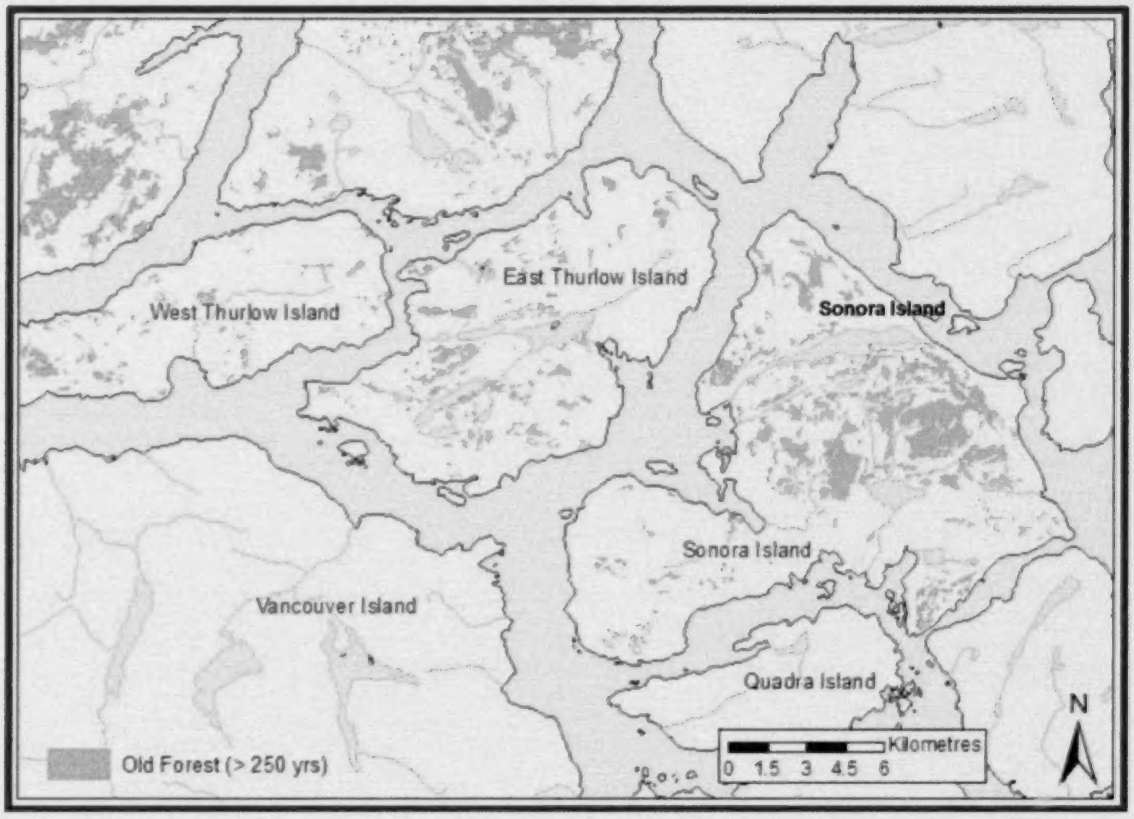

Figure 7. Old forest (dark green) is very rare on Sonora, East Thurlow and West Thurlow Islands.

Recruitment of Old Forest

With the amount of old forest in this area being well below the high-risk target in the SCCO, achievement of the EBM goal for ecological integrity is at risk. In the Board's opinion, with EBM, these situations call for thoughtful recruitment of stands into an old forest state over time.

The SCCO states that if the target amount of old forest is not available, then the target must be met within 250 years. Recruitment of old forest to meet the target as soon as possible, considered with the EBM goal for human well-being, would be prudent to reduce a high risk for ecosystem representation. On the other hand, in the Board's view, harvesting stands that do not meet the SCCO old forest definition but contain significant old forest habitat attributes and as such would be ideal as recruitment areas, could further increase the ecological risk, which is already beyond "high."

As well, it is possible to increase effectiveness for the ecosystem integrity goal by carefully picking recruitment areas that already have some old forest attributes—such as young stands that currently have old trees within them—so that stands functioning like old forest are recruited even sooner. However, the EBM handbook and subsequent EBM documents recognize that EBM strives to achieve high levels of human well-being along with low risks to ecosystem integrity. While the EBM handbook is not explicit in its guidance on how to achieve such a balance, it is a good starting point.

The preamble to SCCO states that the Order "requires the provision of an appropriate balance of social, economic and environmental benefits." The preamble also goes on to state that "human well-being will be supported through policies and initiatives designed to achieve social and economic benefits." The Board understands this to mean that government(s) intend to address human well-being mostly with policies at a relatively high level. Individual licensees trying to manage toward ecological targets, should focus efforts to consider human well-being, on practical operational implementation of SCCO objectives. For example, during cutting permit development, where licensees can meet an ecological objective equally with several options for a reserve patch, they should select the option that will have the least impact on future timber development.[xiii] At the same time, it is the Board's view that economic considerations for human well-being also needs to balance against the ecological risk for the landscape being managed.

A June 10, 2010, JSP agreement/standard operating procedure document, which TimberWest voluntarily committed to follow, clarified that as an interim target no higher than a "high ecological risk" will be incurred. The province's current review of the SCCO commits to achievement of the EBM goal of a low ecological risk averaged across the planning area, at least incrementally. Considering these commitments and the fact that the ecological risk for old forest representation in the Thurlow Landscape Unit is already substantially beyond "high," it follows that some caution would be prudent, in the Board's opinion, even after considering the economic aspects of human well-being.

The Background and Intent Document for the SCCO states "recruitment of oldest possible age classes first will allow for old forest representation targets to be achieved in the shortest time possible." In the February 2014 AAC rationale for TFL 47, BC's deputy chief forester noted that the harvest forecast prepared by the licensee is based on recruiting forest to meet old forest attributes in 250 years. TimberWest, in justifying its approach to modelling achievement of the old forest representation targets in 250 years, rather than a shorter time, stated the SCCO "allows for recruitment of old forest over time, which is consistent with the current legislation." The deputy chief forester goes on to note that the "modelled old-seral retention strategy accords with government legal direction" but **"it may not be completely in accord with the intent of EBM for the area"** (emphasis added).[xiv] TimberWest told the Board that, in practice, it does not plan recruitment as modelled (i.e., just using new cutblocks), nor does it necessarily choose the oldest available stands for recruitment. In practice, TimberWest said it operates somewhere between these two extremes.

In 2011, TimberWest made a commitment to manage its tenures within the SCCO area to achieve an old forest target based on total area rather than a proportion of the range of natural variability or RONV (Appendix 1). The result will be a higher proportion of area reserved. TimberWest is now working with other forest companies it shares landscape units with to design a new SLRD network in the SCCO area, based upon ecosystem units derived from terrestrial ecosystem mapping, an improvement over the past practice of using site series surrogates.

Identifying Red- and Blue-listed Plant Communities

The best available information for at-risk plant communities in BC, including descriptions and locations of known element occurrences, are kept in a database managed by the BC Conservation Data Centre, which also is responsible for developing the red- and blue-lists. However, TimberWest

indicated that it did not rely on the Conservation Data Centre for information. It relies on plant community descriptions in the Order and looks for them in stands that are 250 years old or older.

Guidance from the Association of BC Forest Professionals and the College of Applied Biology indicates that relying only on the guidance in law may not always be appropriate to provide adequate protection for at-risk species. As well, particularly where a species is at high risk, they may need to supplement what is set in law with professional judgement based on sound ecological principles.[xv]

As mentioned earlier in this report, red- and blue-listed plant communities can occur in stands younger than 250 years old, although the Background and Intent Document for the SCCO is not entirely clear in this regard. Therefore, following its current approach, TimberWest may not identify all the occurrences of these plant communities.

Strategic Landscape Reserve Designs

To aid in EBM implementation, including recruitment, a group of licensees involved in the Joint Solutions Project within the SCCO area developed a SLRD to capture old forest areas and spatially designate recruitment areas where the amount of old forest was below targets. The SLRDs are located in 88 landscape units, including four landscape units covering portions of TimberWest's TFL 47. TimberWest was not part of this process to create the initial SLRD. TimberWest also continued to maintain its own non-spatial accounting system to ensure compliance with the SCCO.

TimberWest told the Board that in 2012, the government orally informed them that it would provide guidance as to how it should implement the SLRD. At that time, government indicated the SLRD would include areas where harvesting could not proceed, as well as areas where harvesting could proceed if replacement areas could be found. Using this guidance, TimberWest continued to harvest in the SLRD areas, but only where it knew, from its non-spatial accounting system, replacement areas were available. TimberWest did not designate these replacement areas spatially (on maps) until it received direction to do so through a 2013 letter to licensees from government. This did not initially demonstrate that "cautious management targets and thresholds" were guiding reserve design.

Findings

In the Board's opinion, TimberWest did not meet the spirit and intent of EBM for old forest representation and management of red- and blue-listed plant communities. However, TimberWest started taking steps in the direction of spirit and intent for representation of old forest even before this complaint, but increased those efforts after residents of Sonora Island raised the issue.

In the southern landscape units—the Thurlow Landscape Unit in particular—the ecological integrity goal is at risk, because proportions of old forest are significantly below the high-risk thresholds set in the SCCO. Under EBM there is a need to also consider human-well-being, which is mostly being done by government(s) at a high level. Clearly, the circumstances in the southern landscape units warrant a need for thoughtful management of old forest, including careful identification of old stands and, where deficits occur, cautious development of recruitment strategies, even after considering economic aspects of human well-being.

It is the Board's view that TimberWest's initial interpretation of the definitions of old forest and red- or blue-listed plant communities, as well as a lack of caution in its old forest recruitment strategy, did not demonstrate the careful management associated with EBM to meet the goal of maintaining

ecological integrity. The Board notes that FLNR district staff knew of TimberWest's interpretations and approaches and raised no concerns.

In 2013, TimberWest began working on a refined interpretation of the old forest definition and an initiative to create a new system of reserves that include existing old forest and recruitment areas. Creation of the new reserve system uses terrestrial ecosystem mapping, rather than the less accurate site series surrogates method of determining ecosystem units.

As of March 2015, TimberWest did not consider red- or blue-listed plant communities in stands less than 250 years old. Government has provided no guidance on identification of red- and blue-listed plant communities for EBM purposes. As a result, TimberWest may miss occurrences of these plant communities in stands it is harvesting.

Conclusions

To answer the complainant's concerns about conservation of old forest and red- and blue-listed plant communities in TimberWest's TFL 47, as well as the larger question of whether TimberWest is abiding by the spirit and intent of EBM, the Board considered the following questions:

1. Did TimberWest harvest old forest consistent with the SCCO?
2. Did TimberWest conserve red- or blue-listed plant communities consistent with the SCCO?
3. Did TimberWest follow the spirit and intent of EBM?

The Board concludes that:

1. The definition of old forest in the SCCO is difficult to apply in stands typical of the southern SCCO area, and the SCCO Background and Intent Document, provided as guidance, is not helpful. Licensees operating in the area needed to create interpretations of the definition to guide planning of operations in or near potential old forest stands. TimberWest's harvest was compliant with the SCCO definition and its interpretation of the definition.
2. The Board is unable to conclude if TimberWest's activities were inconsistent with requirements in the SCCO for red- and blue-listed plant communities. This is because of: the ambiguities in government's definition of red- and blue listed plant communities; the lack of further interpretive guidance, particularly on the role of old forest in defining these plant communities; and the general challenges with identifying plant communities four years after harvesting.
3. In the Board's opinion, TimberWest did not manage the forests consistent with the spirit and intent of EBM. After residents of Sonora Island made their concerns known, TimberWest postponed harvest of similar cutblocks not yet harvested. As well, since 2013, TimberWest has been working on a new interpretation of old forest. Prior to the Sonora Island concerns, TimberWest had initiated a new reserve design, not yet completed, based on terrestrial ecosystem mapping. This new direction is more consistent with the spirit and intent of EBM.

Recommendations

Government prepared SCCO as part of the effort to implement EBM in the South Central Coast area. Many of the forest management actions required to meet the objectives in SCCO are the responsibility of the forest licensees. Forest licensees must interpret aspects of SCCO in order to determine the appropriate forest management actions. The Board believes that many of the issues that came to the forefront in this investigation stem from:

- a lack of a clear definition and guidance for recognition of old forest;
- a lack of guidance regarding identification of red-listed and blue-listed plant communities;
- an assumption that red- or blue-listed plant communities generally do not occur outside of stands classified as "old"; and
- inconsistent understanding of the spirit and intent of EBM and how it relates to the SCCO.

Under section 131(2) of the *Forest and Range Practices Act*, the Board makes the following recommendations:

1. Government should ensure that the meaning of the term "old forest" is sufficiently clear to fit with the ecological conditions present in the SCCO area and to align with the intent of EBM.
2. Government should ensure that the definitions for red- and blue-listed plant communities are clear for the SCCO area and that effective guidance for identification of these plant communities is available.
3. TimberWest should provide the Board with information on how it will interpret the SCCO definition of old forest when conducting forest operations within the SCCO area.

Under section 132(1) of the *Forest and Range Practices Act*, the Board requests that government respond to recommendations one and two by December 31, 2015.

Under section 132(1) of the *Forest and Range Practices Act*, the Board requests that TimberWest respond to recommendation three by December 31, 2015.

Endnotes

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[iv] T. Tripp, D. Hopwood, June 15, 2013, *Assessment of Old Forest and Associated Biodiversity Values – Block 11-370 and Adjacent Areas, TFL 47, Sonora Island.*
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Association of BC Forest Professionals. 2012. *Non-statutory Expectations Series – Applying the Obligation to Weigh and Balance in Professional Service.* Guidance for Resource Professionals.
[xii] Coast Information Team, March 2004, *Ecosystem-Based Management Planning Handbook.* P 37
[xiii] Schedule K – *JSP Recommendations on Final Implementation of Ecosystems-Based Management in the Great Bear Rainforest,* January 28, 2014, Page 144/145.
[xiv] FLNR, Feb 4, 2014, *Tree Farm Licence 47 Rationale for Allowable Annual Cut Determination,* p.29.
[xv] Association of BC Forest Professionals and the College of Applied Biology of BC. 2009. *Managing Species at Risk in British Columbia.* Guidance for Resource Professionals.

APPENDIX 1: The RONV Concept

The EBM Handbook uses a concept called range of natural variation (RONV) to determine the required amount of old forest to maintain ecological integrity. Natural forests subjected to normal ecosystem disturbances over time have a typical abundance of older stands. The RONV concept as described in the Handbook assumes risk to ecological integrity increases as the proportion of old forest deviates further from historic levels. Old forest target calculations, expressed as percentage of RONV, have been completed, for each ecosystem unit in the SCCO area, allowing the SCCO to specify "risk-managed old forest representation targets" (Table 3).

Risk-managed targets for the Thurlow, Gray and Fulmore landscape units have been all set at 30 percent of the RONV, resulting in old forest requirements from 12 to 26 percent of the area depending on the ecosystem unit. There are also additional old forest requirements specified in the Order for certain ecosystem units specific to the Thurlow, Gray and Fulmore landscape units. These ecosystem units, when grouped in biogeoclimatic units with the additional old forest requirements, yield average old forest targets of 24 to 31 percent (Table 4).

Table 3. Example of How Old Forest Targets Are Determined

RONV		Risk-based Landscape Unit target		Risk-based Landscape Unit target		Total Area in the Landscape Unit		Landscape Unit Target
(% of forest that is typically old)		(% of RONV)		(% of total area)				
76%	x	30%	=	23%	x	2679 ha	=	616 ha

This example is for the CWHxm2 HB Medium ecosystem unit (site series surrogate) in Thurlow landscape unit.

Table 4. Old Forest in the Southern Landscape Units*

Landscape Unit	Biogeoclimatic Classification	Forested Area	Old Forest	Old Forest Target	Old Forest	Old Forest Target	Surplus/ Deficit
		ha.	ha.	ha.	%	%	ha.
Thurlow	**Total**	**39,060**	**4,778**	**11,609**	**12.2%**	**29.7%**	-6,831
	CWHxm	24,383	1,888	7,450	7.7%	30.6%	-5,562
	CWHdm	1,571	155	434	9.9%	27.6%	-279
	CWHvm1, 2	5,455	694	1,369	12.7%	25.1%	-676
	CWHmm	7,651	2,042	2,356	26.7%	30.8%	-315
Gray	**Total**	**23,380**	**6,367**	**6,392**	**27.2%**	**27.3%**	-25
	CWHdm	5,878	262	1,839	4.5%	31.3%	-1,576
	CWHvm1, 2	15,880	4,773	4,111	30.1%	25.9%	662
	MHmm	1,621	1,331	443	82.1%	27.3%	888
Fulmore	**Total**	**76,550**	**18,924**	**18,559**	**24.7%**	**24.2%**	**365**
	CWHdm	1,568	222	467	14.2%	29.8%	-245
	CWHvm1, 2	72,446	16,728	17,434	23.1%	24.1%	-706
	MHmm	2,521	1,970	658	78.1%	26.1%	1,312

* FLNR, Feb 4, 2014, *Tree Farm Licence 47 Rationale for Allowable Annual Cut Determination*, p.29.

APPENDIX 2: EBM Principles in the Great Bear Rainforest

Guiding Principles in the Ecosystem-Based Management Planning Handbook 2004

The CIT, building on the Central Coast Agreement reached in 2001, elaborated the following principles for EBM:

- ***Maintain ecological integrity*** — by sustaining the biological richness and services provided by natural terrestrial and marine processes, including the structure, function and composition of natural terrestrial, hydroriparian and coastal ecosystems, at all scales through time.
- ***Recognize and accommodate aboriginal Rights and Title, and interests*** — by respecting First Nations governance and authority, and by working with First Nations to achieve mutually acceptable resource planning and stewardship, and fair distribution of economic benefits.
- ***Promote human well-being*** — by assessing risks and opportunities for communities; by facilitating and enabling a diversity of community economic and business activity; and by planning for local involvement in existing and future economic activities.
- ***Sustain cultures, communities, and economies within the context of healthy ecosystems*** — by sustaining the biological richness and ecological services provided by natural ecosystems, while stimulating the social and economic health of the communities that depend on, and are part of, those ecosystems.
- ***Apply the precautionary principle*** — by recognizing uncertainty and by working to establish and implement management objectives and targets that err on the side of caution. The onus is on the proponent to show that management is meeting designated objectives and targets.
- ***Ensure planning and management is collaborative*** — by encouraging broad participation in planning; by clearly articulating collaborative decision-making procedures; by respecting the diverse values, traditions and aspirations of local communities; and by incorporating the best of existing knowledge including traditional, local and scientific knowledge.
- ***Distribute benefits fairly*** — by acknowledging the cultural and economic connections that local communities have to coastal ecosystems, and by ensuring that diverse and innovative initiatives increase the share of employment, economic development, and revenue flowing to local communities, and maintain cultural and environmental amenities and other local benefits derived from land and water resources.[16]

[16] Principles adapted from Coast Information Team. 2003. Ecosystem-based Management Framework.

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